

WHAT IS CLAIMED IS:

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1. A nonaqueous electrolyte secondary battery comprising a positive electrode having a positive electrode active material, a negative electrode containing a negative electrode active material capable of being doped/undoped with lithium, and a nonaqueous electrolyte,

wherein the nonaqueous electrolyte comprises at least one of thiols, thiophenes, thioanisoles, thiazoles, thioacetates, aromatic sulfones, and the derivatives thereof.

2. A nonaqueous electrolyte secondary battery according to Claim 1, wherein the content of at least one of thiols, thiophenes, thioanisoles, thiazoles, thioacetates, aromatic sulfones, and the derivatives thereof is in the range of 0.03 percent by weight to 10 percent by weight of the entire electrolyte.

3. A nonaqueous electrolyte secondary battery according to one of Claims 1 and 2, wherein the thiols are selected from the group consisting of methanethiol, ethanethiol, thiophenol, 4-fluorothiophenol, 2-chlorothiophenol, 4-t-butylthiophenol, 4-t-butyl-1,2-benzenethiol, and derivatives thereof.

4. A nonaqueous electrolyte secondary battery according to Claim 1, wherein the positive electrode active material comprises one of a lithium-containing metal oxide and an intercalation compound containing lithium.

5. A nonaqueous electrolyte secondary battery according to Claim 4, wherein the positive electrode active material comprises a composite oxide of lithium and a transition metal represented by the general formula LiM_xO_y , wherein M is at least one selected from the group consisting of Co, Ni, Mn, Fe, Al, V, and Ti.

6. A nonaqueous electrolyte secondary battery according to Claim 1, wherein the negative electrode active material comprises a carbonaceous material or at least one metal which alloys with lithium.

7. A nonaqueous electrolyte secondary battery according to Claim 1, wherein the negative electrode active material comprises at least one selected from a carbonaceous material, a crystallized metal oxide, and an amorphous metal oxide.

8. A nonaqueous electrolyte secondary battery according to Claim 1, wherein the negative electrode active

material comprises a carbonaceous material selected from the group consisting of a graphitizable carbonaceous material, a nongraphitizable carbonaceous material, and a graphite material.

9. A nonaqueous electrolyte secondary battery according to Claim 1, wherein the nonaqueous electrolyte is one selected from a liquid nonaqueous electrolyte prepared by dissolving an electrolyte salt into a nonaqueous solvent, a gelified electrolyte prepared by gelifying the nonaqueous electrolyte liquid by using a gelatinizer, a polymer gel electrolyte containing an electrolyte salt dissolved in a nonaqueous electrolyte which is held in a polymer matrix, and a solid electrolyte containing an electrolyte salt dissolved in a polymer matrix.

10. A nonaqueous electrolyte secondary battery according to Claim 9, wherein the polymer matrix comprises one selected from the group consisting of poly(vinylidene fluoride), copolymers of vinylidene fluoride and hexafluoropropylene, polyamides, aromatic polyamides, polyolefins, polyesters, polycarbonates, polyimides, poly(met)acrylates, and polyacrylonitrile.

11. A nonaqueous electrolyte secondary battery

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according to Claim 9, wherein the electrolyte salt comprises at least one lithium salt selected from the group consisting of LiClO_4 , LiAsF_6 , LiPF_6 , LiBF_4 , $\text{LiB}(\text{C}_6\text{H}_5)_4$, $\text{CH}_3\text{SO}_3\text{Li}$, $\text{CF}_3\text{SO}_3\text{Li}$, $\text{LiN}(\text{CF}_3\text{SO}_2)_2$, $\text{LiC}(\text{CF}_3\text{SO}_2)_3$, LiCl , and LiBr .

12. A nonaqueous electrolyte secondary battery according to Claim 1, further comprising a separator and an exterior casing,

wherein the positive electrode comprises a positive electrode sheet comprising a positive electrode collector and positive electrode active material layers containing the positive electrode active material formed on the positive electrode collector,

wherein the negative electrode comprises a negative electrode sheet comprising a negative electrode collector and negative electrode active material layers containing the negative electrode active material formed on the negative electrode collector,

wherein the positive electrode and the negative electrode are stacked with the separator therebetween and the resulting stack is rolled in the longitudinal direction to form spirally-wound electrodes, and

wherein the spirally-wound electrodes are accommodated in the exterior casing.

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